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10/582,453

06/14/2007

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EXAMINER

ZIMMERMANN, JOHN P

ART UNIT

PAPER NUMBER

2861

MAIL DATE

DELIVERY MODE

09/01/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,453	Applicant(s) EVE, RICHARD WILLIAM	
	Examiner John P. Zimmermann	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-15,17 and 21-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-15,17 and 21-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 23 June 2009 has been entered.

Response to Amendment

2. With respect to applicant's Amendments to the claims:
- a. Applicant's amendments to independent **Claims 1 & 17** to include additional significant limitations as well as clarification have been recognized and examined as such.
 - b. **Claim 16** has been cancelled as requested.
 - c. Applicant's addition of newly added dependent **Claim 25** and independent **Claims 26 & 27** has been recognized and they have been examined as such.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

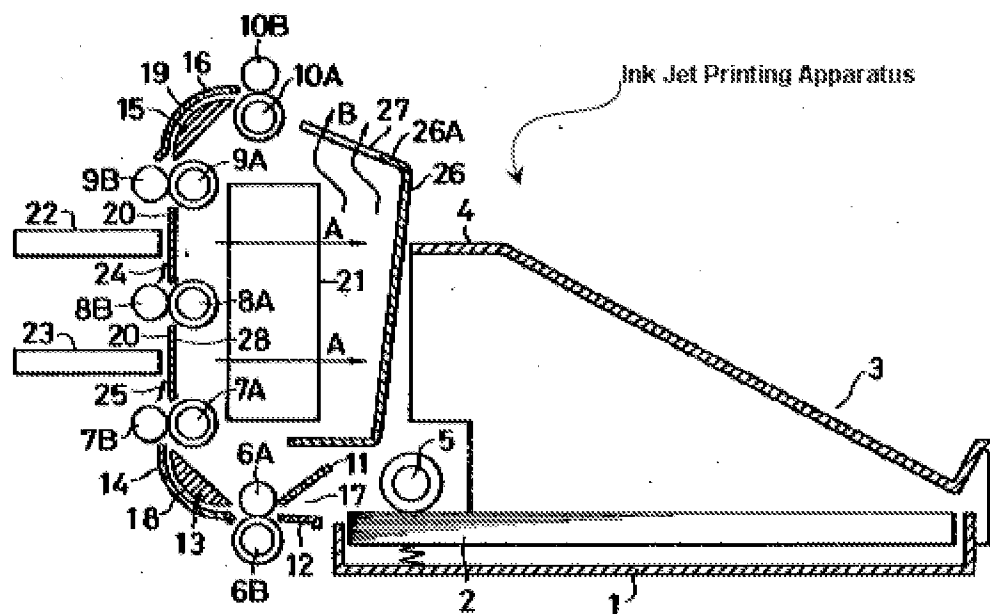
5. **Claims 1, 3-4, 6-7, 10, 14, 23, 16 & 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koumura et al.** (US 4,463,361 A) in view of **Kitahara et al.** (US 2002/0018097 A1).

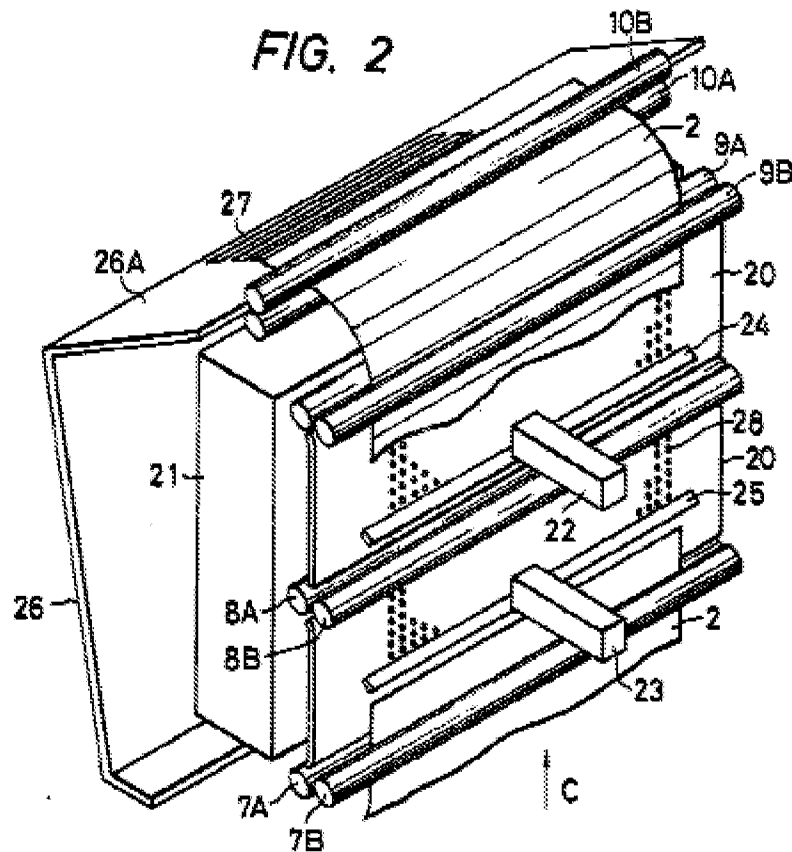
a. As related to independent **claim 1**, Koumura et al. teach an ink jet printing apparatus including a printhead arrangement for printing an image on a substrate in a pass of the substrate past the printhead arrangement in a printing direction (Koumura et al. – Title; Abstract; and Figure 1, Reference #2 & Arrows, shown below), the printer comprising: a printhead arrangement including a plurality [i.e. two] of ink jet printheads for emitting droplets towards a surface of the substrate to form the image wherein the apparatus is adapted to hold the printheads substantially stationary while droplets are emitted from the printheads (Koumura et al. – Detailed Description, Column 2, Lines 67-68 and Figures 1 & 2, Reference #22 & #23, both shown below); a plurality of rollers arranged to move the substrate past the printheads during the emission of the droplets from the printheads to print the image (Koumura et al. – Detailed Description, Column 2, Lines 60-61 and Figures 1 & 2, Reference #7A - #9B both shown below); and the apparatus further includes a pressure source wherein the pressure source is arranged to

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apply a negative gauge pressure [i.e. a suction] to the substrate to hold the substrate to the rollers in the region of the printhead arrangement (Koumura et al. – Detailed Description, Column 2, Lines 66-67; and Figures 1 & 2, Reference #21, #A & Arrows, both shown below).

FIG. 1





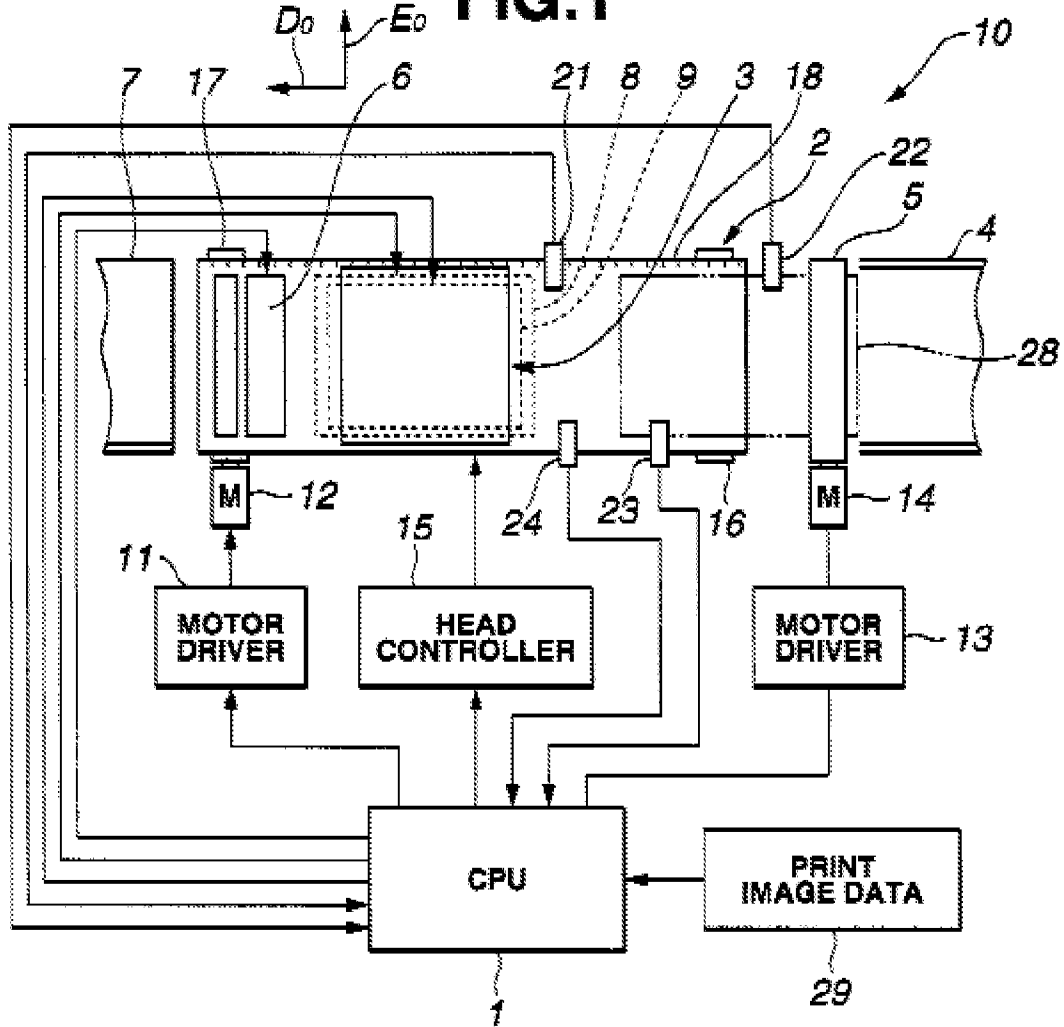
b. Continuing with independent **claim 1**, Koumura et al. *does not* specifically teach the printhead arrangement extending across substantially the full width of the substrate. *However*, Koumura et al. *does* teach a variety of substrates and one of ordinary skill in the art at the time of the invention, when taking the phrase "substantially the full width of the substrate" in it's broadest sense, would understand that any substrate with a width slightly wider than that of the depicted printhead would clearly teach the broadest interpretation of the limitation as presently claimed. *Additionally*, Kitahara et al. specifically teaches the majority of the claimed limitations to include the ink jet printing apparatus including a printhead arrangement for printing an image on a substrate in a pass of the substrate past the printhead arrangement in a printing direction wherein the

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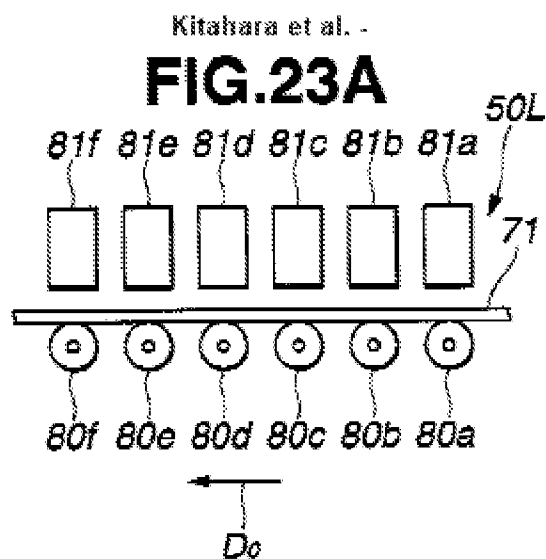
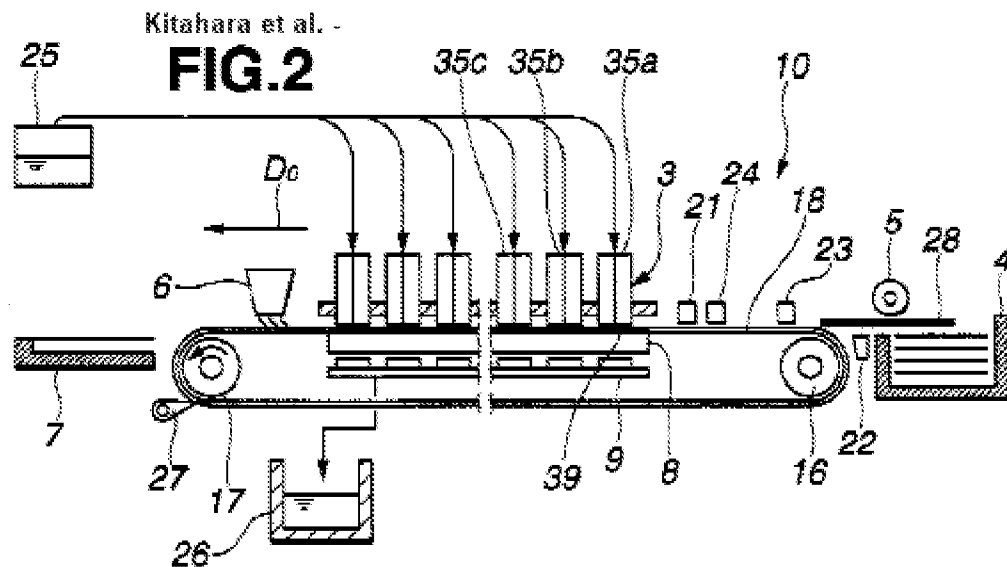
printhead arrangement extends across the full width of any substrate that fits in the printing apparatus and across substantially the full width of the substrate conveyance means in a direction perpendicular to the printing direction (Kitahara et al. – Title; Abstract; Summary, Page 1, Paragraph 12; and Figures 1 & 2, Reference #3 & #28, both shown below), wherein the apparatus is adapted to hold the printheads stationary while droplets are emitted from the printheads, and the printing apparatus includes a plurality of rollers arranged to move the substrate past the printheads during the emission of the droplets (Kitahara et al. – Abstract and Figure 23A, Reference #81* & 80*, shown below).

Kitahara et al. -

FIG. 1



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Given the same field of endeavor, specifically an ink-jet printing system with a substrate transport mechanism, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording apparatus with a negative gauge pressure source and a plurality of rollers as taught by Koumura et al. with the specific use of a printhead arrangement that extends across the entire width of the printable surface as taught by Kitahara et al., in an effort to provide an

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ink jet printing system where the printer head need not be shifted in the process of printing which can then be done at a high rate of speed (Kitahara et al. - Abstract).

c. As related to dependent **claim 2**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the apparatus is adapted to print onto the surfaces of a plurality of discrete substrates [i.e. the guides are elastic so they can accommodate a variety of substrates no matter the thickness] (Koumura et al. – Detailed Description, Column 3, Lines 8-11). While the wording is not identical, it would have been obvious to one of ordinary skill in the art at the time of the invention to understand the device as taught by the combination of Koumura et al. and Kitahara et al. would not have been limited to anything less than a "plurality of discrete substrates."

d. As related to dependent **claim 3**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the apparatus includes at least three rollers arranged to move the substrate relative to the printheads (Koumura et al. – Detailed Description, Column 2, Lines 60-61 and Figures 1 & 2, Reference #7A - #9B both shown above and Kitahara et al. – Abstract and Figure 23A, Reference #81* & 80*, shown above).

e. As related to dependent **claim 4**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the rollers are mounted substantially parallel to the adjacent rollers [i.e. rollers are parallel to adjacent rollers] (Koumura et al. – Detailed Description, Column 2, Lines 60-61 and

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Figure 1, Reference #7A, #8A, #9A - #7B, #8B, & #9B shown above and Kitahara et al.

– Abstract and Figure 23A, Reference #81* & 80*, shown above).

f. As related to dependent **claim 6**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the negative gauge pressure [i.e. a suction] is applied to the substrate in a region between adjacent rollers (Koumura et al. – Detailed Description, Column 2, Lines 66-67 and Figure 1, Reference #7A, #8A, #9A, #A & Arrows, shown above).

g. As related to dependent **claim 7**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach an element [i.e. suction plate] arranged between the rollers adjacent the substrate (Koumura et al. – Detailed Description, Column 2, Line 65 – Column 3, Line 11 and Figures 1, Reference #7A, #8A, #9A, & #20, shown above).

h. As related to dependent **claim 10**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach a guide for guiding a leading edge of the substrate (Koumura et al. – Detailed Description, Column 2, Line 65 – Column 3, Line 11 and Figure 1, Reference #24, #25, & #20, shown above).

i. As related to dependent **claim 11**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the substrate could comprise a variety of materials. While the wording is not identical, it would have been obvious to one of ordinary skill in the art at the time of the invention to understand the device as taught by the combination of Koumura et al. and Kitahara et al.

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would have been capable of printing on a substrate comprising a substantially rigid material [i.e. card stock paper] and would not have been limited to anything less.

j. As related to dependent **claim 12** the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the substrate could comprise a variety of materials. While the wording is not identical, it would have been obvious to one of ordinary skill in the art at the time of the invention to understand the device as taught by Koumura et al. would have been capable of printing on a substrate that when being printed, could be mounted on a deformable surface [i.e. normal paper, or cloth] and would not have been limited to anything less due in part to the function the vacuum, suction plate and rollers were intended to accomplish.

k. As related to dependent **claim 14**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the system is adapted to print a color image [i.e. red and/or black] (Koumura et al. – Detailed Description, Column 3, Lines 23-25 and Figure 1, Reference #22, & #23, shown above) [i.e. black, yellow, cyan, magenta] (Kitahara et al. – Description, Pages 4-5, Paragraphs 87-90 and Figure 2, Reference #3, shown above).

l. As related to dependent **claim 15**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the apparatus is adapted to print an image having a resolution of greater than 120 dpi [i.e. greater than 200 dpi or 400 dpi] (Kitahara et al. – Background, Page 1, Paragraph 8 and Description, Page 5, Paragraph 92).

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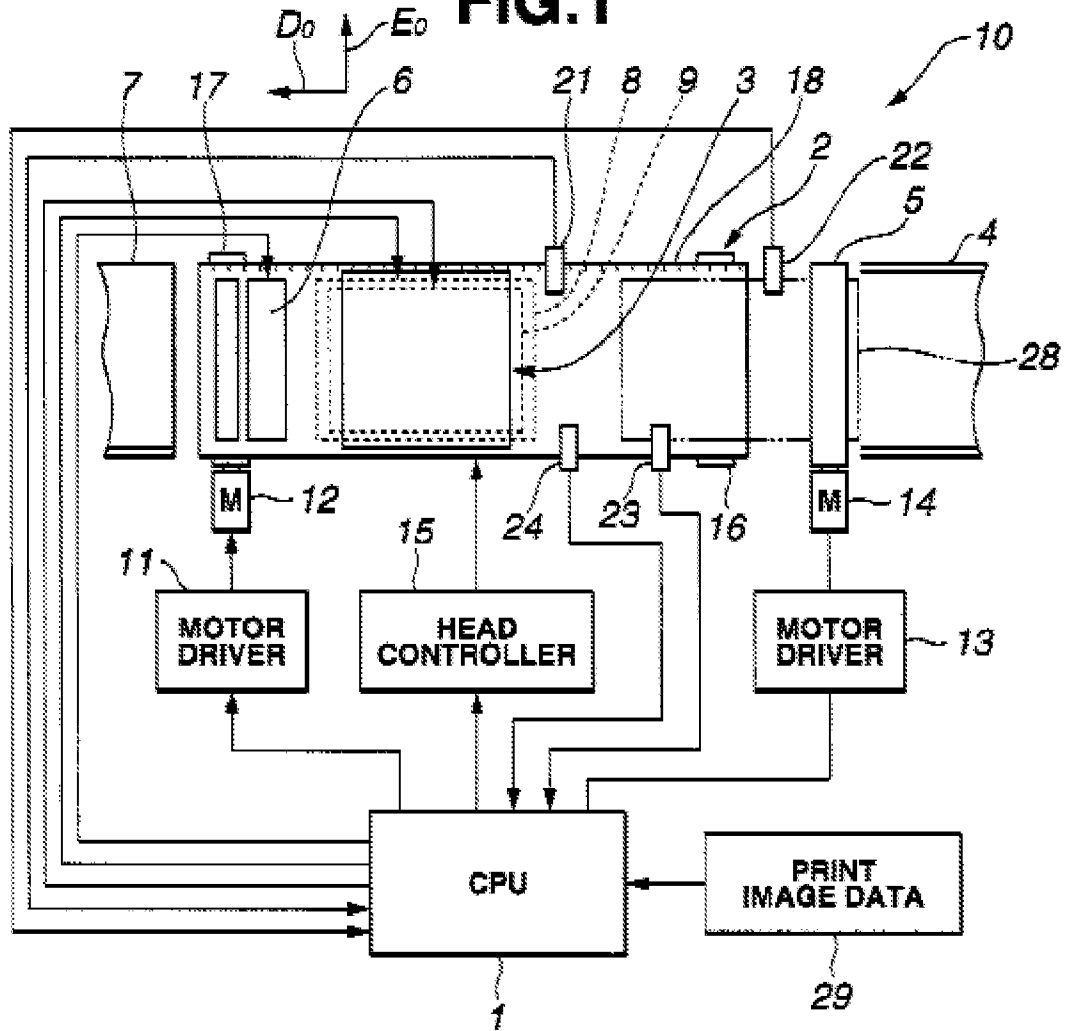
m. As related to dependent **claim 23**, the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the rollers are substantially non-porous [i.e. the rollers are non-porous] (Koumura et al. – Detailed Description, Column 2, Lines 60-67 and Figure 1, Reference #7A, #8A, #9A, shown above).

n. As related to independent **claim 17**, Koumura et al. teaches a method of printing a substrate in an ink jet printer (Koumura et al. – Title; Abstract; Detailed Description, Column 3, Line 57 – Column 4, Line 35), comprising: a printhead arrangement (Koumura et al. – Detailed Description, Column 2, Lines 67-68 and Figures 1 & 2, Reference #22 & #23, both shown above), a plurality of rollers (Koumura et al. – Detailed Description, Column 2, Lines 60-61 and Figures 1 & 2, Reference #7A - #9B both shown above) and a pressure source wherein the substrate is moved on the rollers relative to the printheads during printing while applying a negative gauge pressure [i.e. a suction] to the substrate to hold the substrate to the rollers in the region of the printheads (Koumura et al. – Detailed Description, Column 2, Lines 66-67; and Figures 1 & 2, Reference #21, #A & Arrows, both shown above) and holding the printheads substantially stationary during the printing of the image on the substrate. Koumura et al. **does not** specifically teach the printheads extend at least the full width of the image to be printed in a direction perpendicular to the printing direction. **However**, Kitahara et al. specifically teaches the majority of the claimed method limitations to include the ink jet printing apparatus including a printhead arrangement for printing an image on a substrate while moving the substrate on the rollers past the printheads that extend at least the full

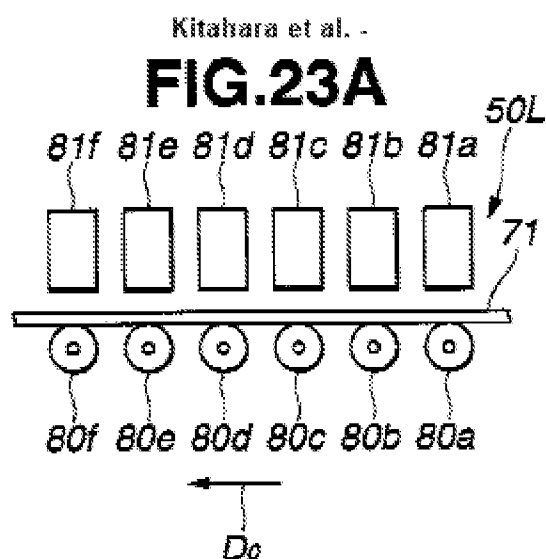
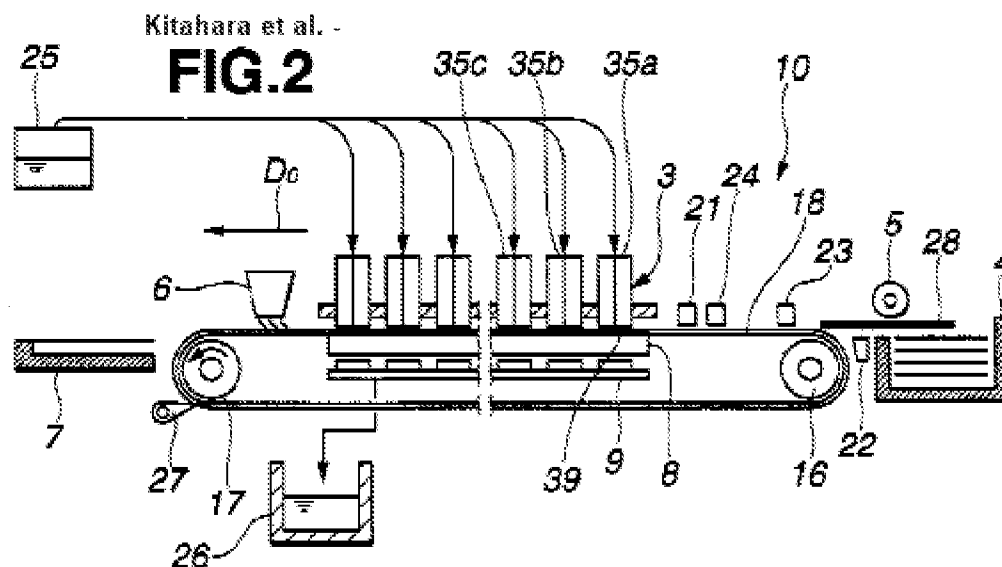
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width of the image to be printed in a direction perpendicular to the printing direction such that the printhead arrangement prints the image onto the substrate in one pass of the substrate past the printhead arrangement (Kitahara et al. – Title; Abstract; Summary, Page 1, Paragraph 12; and Figures 1 & 2, Reference #3 & #28, both shown below), while holding the printheads stationary while droplets are emitted from the printheads, and during the printing of the image on the substrate (Kitahara et al. – Abstract and Figure 23A, Reference #81* & 80*, shown below).

Kitahara et al. -

FIG. 1

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Given the same field of endeavor, specifically a method of printing a substrate on an ink-jet printing system with a substrate transport mechanism, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording apparatus with a negative gauge pressure source and a plurality of rollers as taught by Koumura et al. with the specific use of a printhead arrangement that extends across the entire width of the printable surface as taught by Kitahara et al., in an effort to provide an ink jet printing system where the printer head

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need not be shifted in the process of printing which can then be done at a high rate of speed (Kitahara et al. - Abstract).

o. As related to independent **claim 26**, Koumura et al. teaches a printhead arrangement for printing an image on a substrate, wherein the printhead arrangement includes a plurality of ink jet printheads for emitting droplets towards a surface of the substrate to form the image (Koumura et al. – Title; Abstract; and Figure 1, Reference #2 & Arrows, shown below) wherein the apparatus is adapted to hold the printheads substantially stationary while ink is emitted towards the substrate and the substrate is moved past the printheads (Koumura et al. – Detailed Description, Column 2, Lines 67-68 and Figures 1 & 2, Reference #22 & #23, both shown below); a transport device for moving the substrate through an ink jet printer, the device comprising a plurality of substrate support elements for supporting the substrate in the printer, the support elements including a plurality of rollers arranged to move the substrate past the printheads during emission of droplets on the substrate, wherein the support elements of the transport device are all substantially aligned so that the path of the substrate through the printer is substantially planar (Koumura et al. – Detailed Description, Column 2, Lines 60-61 and Figures 1 & 2, Reference #7A - #9B both shown below); and the transport device further includes a pressure source wherein the pressure source is arranged to apply a negative gauge pressure [i.e. a suction] to the substrate to hold the substrate to the rollers in the region of the printhead arrangement (Koumura et al. – Detailed Description, Column 2, Lines 66-67; and Figures 1 & 2, Reference #21, #A & Arrows, both shown below).

FIG. 1

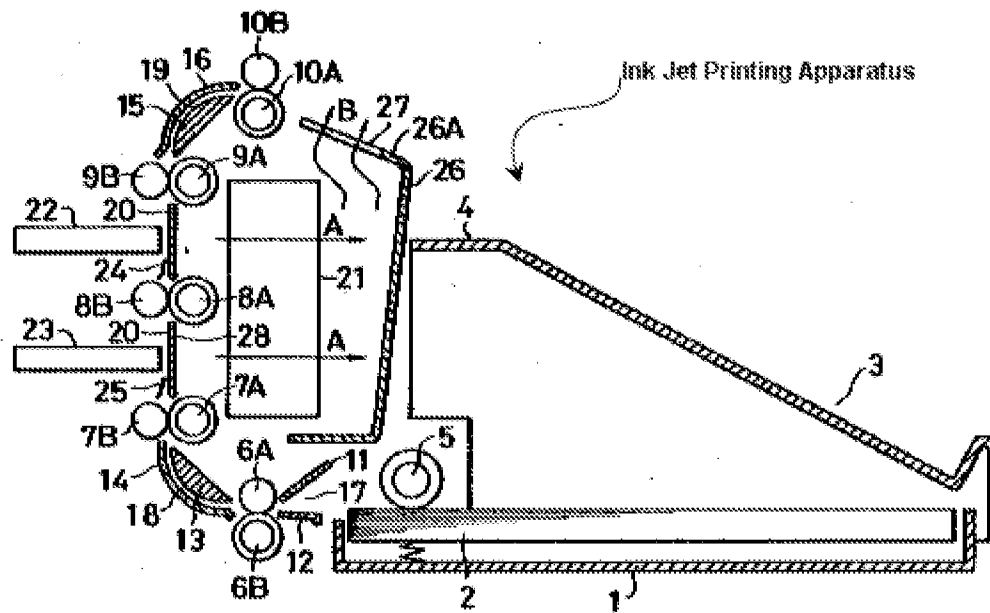
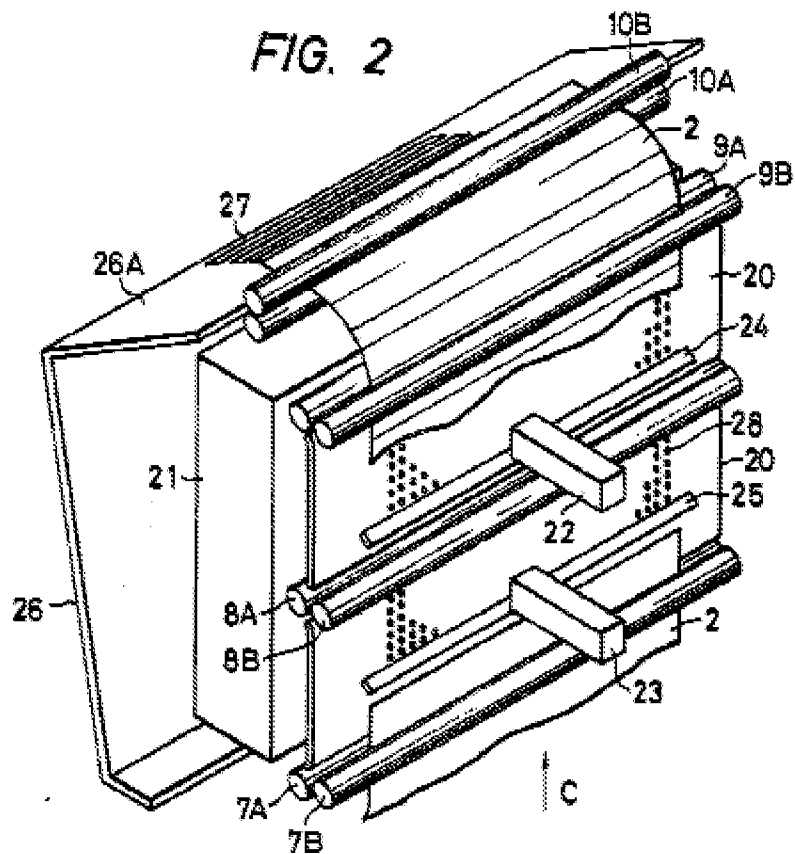


FIG. 2

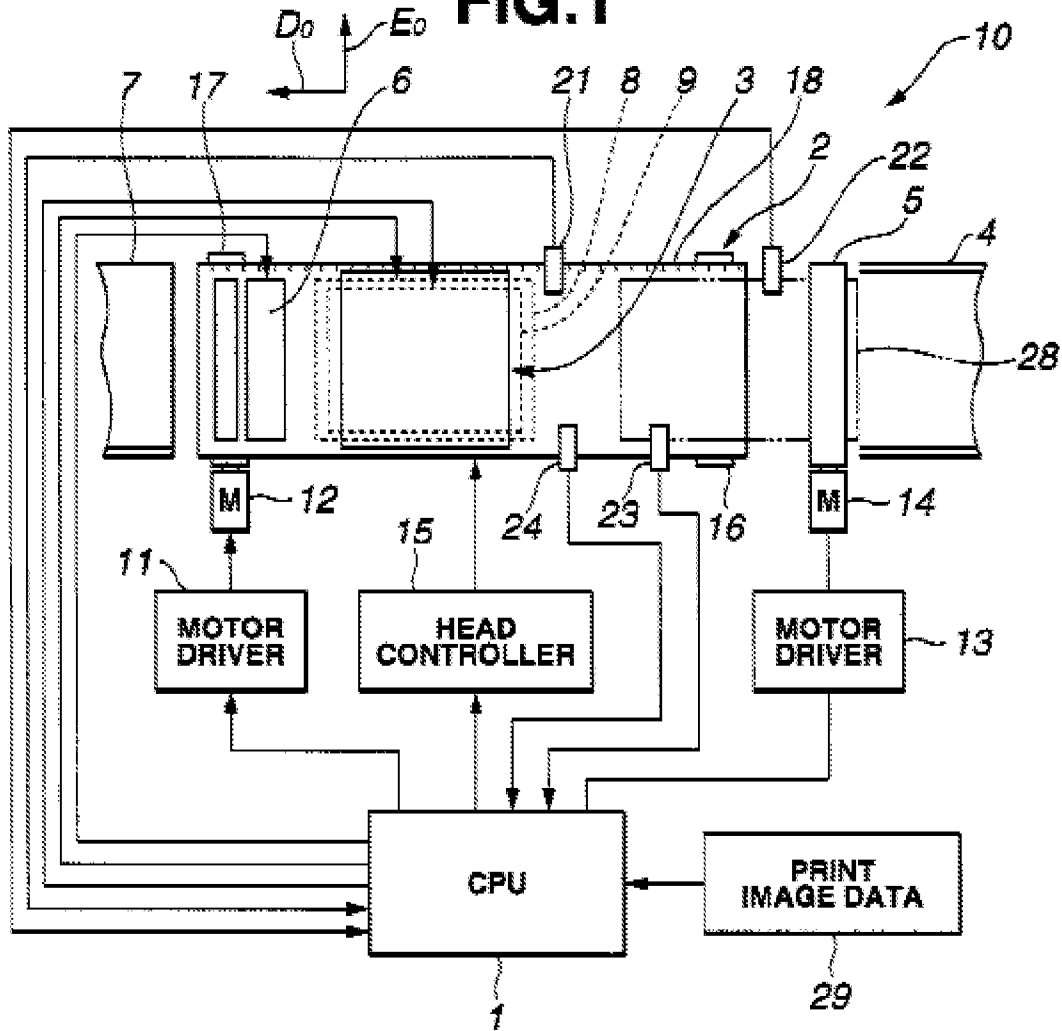


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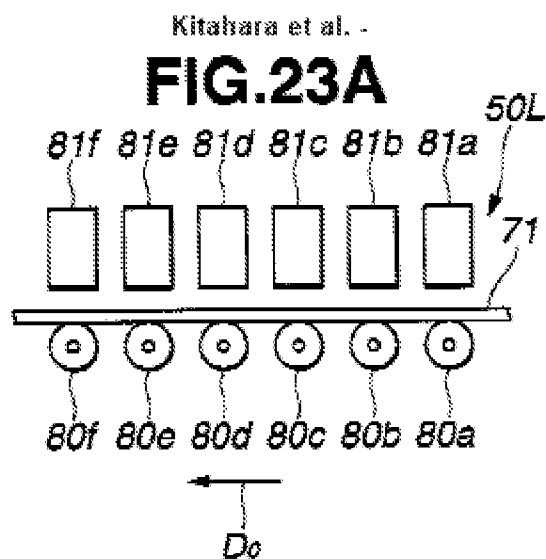
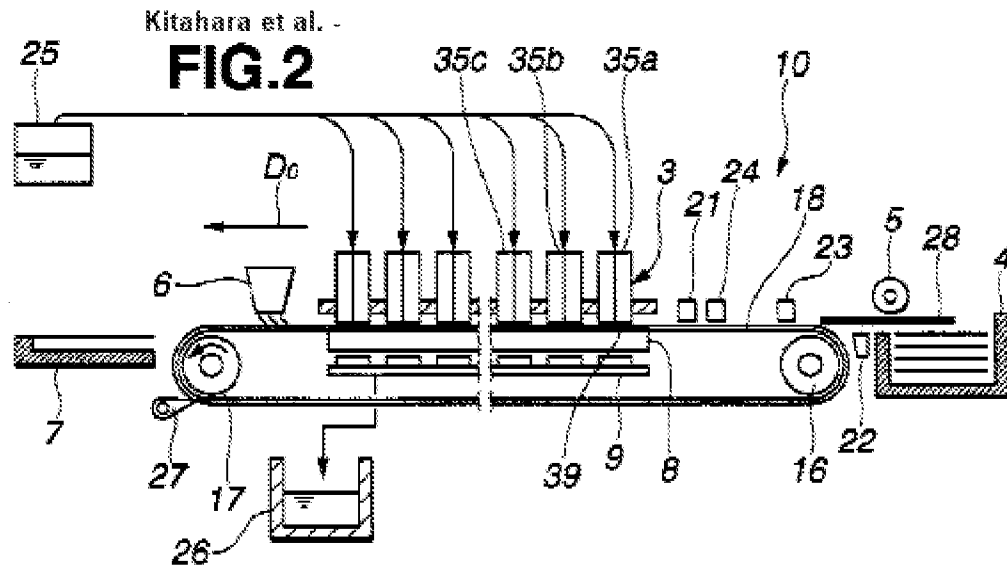
p. Continuing with independent **claim 26**, while Koumura et al. teaches holding the printheads substantially stationary while ink is emitted, Kitahara et al. specifically teaches the majority of the claimed limitations to include the ink jet printing apparatus including a printhead arrangement for printing an image on a substrate in a pass of the substrate past the printhead arrangement in a printing direction wherein the printhead arrangement extends across the full width of any substrate that fits in the printing apparatus and across substantially the full width of the substrate conveyance means in a direction perpendicular to the printing direction (Kitahara et al. – Title; Abstract; Summary, Page 1, Paragraph 12; and Figures 1 & 2, Reference #3 & #28, both shown below), wherein the apparatus is adapted to hold the printheads *substantially* stationary while droplets are emitted from the printheads, and the printing apparatus includes a transport device which comprises a plurality of substrate support elements which include a plurality of rollers arranged to move the substrate past the printheads during the emission of the droplets (Kitahara et al. – Abstract and Figure 23A, Reference #81* & 80*, shown below) all while keeping the path of the substrate through the printer substantially planer (Kitahara et al. – Figure 2, Reference #28 and Figure 23A, Reference #81* & 80*, both shown below).

Kitahara et al. -

FIG. 1



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Given the same field of endeavor, specifically an ink-jet printing system with a substrate transport mechanism, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording apparatus with a negative gauge pressure source and a transport device as taught by Koumura et al. with the specific use of a printhead arrangement that extends across the entire width of the printable surface and holds the printheads substantially stationary while ink is emitted as taught by Kitahara et al., in an effort to provide an ink jet printing

system where the printer head need not be shifted in the process of printing which can then be done at a high rate of speed (Kitahara et al. - Abstract).

q. As related to independent **claim 27**, Koumura et al. teaches a method of printing a onto a substantially rigid substrate in an ink jet printing apparatus (Koumura et al. – Title; Abstract; Detailed Description, Column 3, Line 57 – Column 4, Line 35). This substrate could comprise a variety of materials. While the wording is not identical, it would have been obvious to one of ordinary skill in the art at the time of the invention to understand the device as taught by Koumura et al. would have been capable of printing on a substrate comprising a substantially rigid material [i.e. card stock paper] and would not have been limited to anything less. The ink jet printing apparatus comprises: a printhead arrangement for printing an image on the substrate (Koumura et al. – Detailed Description, Column 2, Lines 67-68 and Figures 1 & 2, Reference #22 & #23, both shown above), and a transport device including a plurality of rollers (Koumura et al. – Detailed Description, Column 2, Lines 60-61 and Figures 1 & 2, Reference #7A - #9B both shown above) and a pressure source wherein the substrate is moved on the rollers relative to the printheads during printing while applying a negative gauge pressure [i.e. a suction] to the substrate to hold the substrate to the rollers in the region of the printheads (Koumura et al. – Detailed Description, Column 2, Lines 66-67; and Figures 1 & 2, Reference #21, #A & Arrows, both shown above) and holding the printheads substantially stationary during the printing of the image on the substrate. While Koumura et al. teaches holding the printheads substantially stationary while ink is emitted, Kitahara et al. specifically teaches the majority of the claimed method limitations to include the

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ink jet printing apparatus including a printhead arrangement for printing an image on a substrate while moving the substrate into the printer and onto roller and past the printhead arrangement in a printing direction wherein the printhead arrangement extends across the full width of any substrate that fits in the printing apparatus and across substantially the full width of the substrate conveyance means in a direction perpendicular to the printing direction (Kitahara et al. – Title; Abstract; Summary, Page 1, Paragraph 12; and Figures 1 & 2, Reference #3 & #28, both shown above), wherein the apparatus is adapted to hold the printheads *substantially* stationary while droplets are emitted from the printheads, and the printing apparatus includes a transport device which comprises a plurality of substrate support elements which include a plurality of rollers arranged to move the substrate past the printheads during the emission of the droplets (Kitahara et al. – Abstract and Figure 23A, Reference #81* & 80*, shown above) all while keeping the path of the substrate through the printer substantially planer (Kitahara et al. – Figure 2, Reference #28 and Figure 23A, Reference #81* & 80*, both shown above).

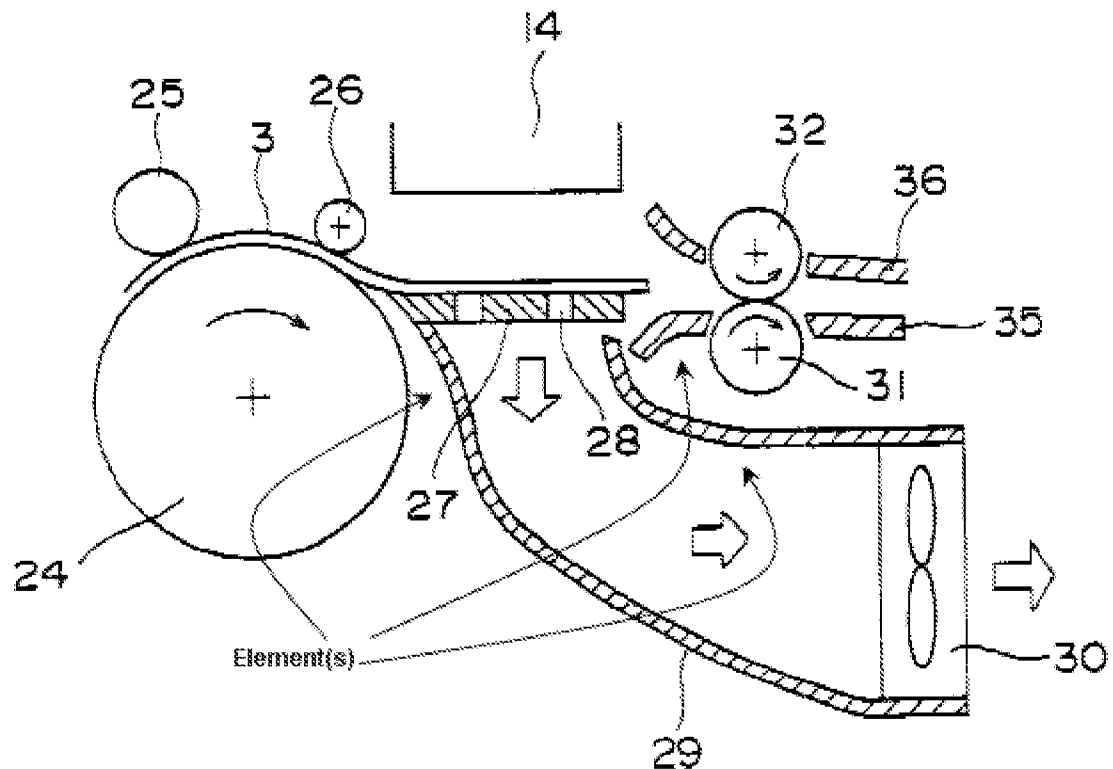
Given the same field of endeavor, specifically a method of printing a substrate on an ink-jet printing system with a substrate transport mechanism, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording apparatus with a negative gauge pressure source and a transport device including a plurality of rollers as taught by Koumura et al. with the specific use of a printhead arrangement that extends across the entire width of the printable surface and holds the printheads substantially stationary while ink is emitted as taught by Kitahara et al., in an effort to provide an ink jet printing system where the printer head need not be shifted in the process of printing which can then be done at a high rate of speed (Kitahara et al. - Abstract).

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6. **Claims 8-9 & 21-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koumura et al.** (US 4,463,361 A) and **Kitahara et al.** (US 2002/0018097 A1) as applied above and further in view of **Yasui et al.** (US 6,416,176 B1).

a. As related to dependent **claim 8**, while the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 7** for the reasons above and continues to teach the element could be arranged to restrict airflow (innate characteristic of a suction plate), the combination of Koumura et al. and Kitahara et al. *does not* specifically teach restricting airflow between rollers. *However*, Yasui et al. teaches an ink-jet printing system with a transport mechanism that includes a plurality of rollers, a negative gauge pressure source, and an element which is arranged to restrict the airflow between the rollers (Yasui et al. - Title; Abstract; and Figure 2, Reference #14, #24, #31, #29, and Arrows, shown below).

F I G. 2



b. As related to dependent **claim 9**, while the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 7** for the reasons above and continues to teach the element could be arranged to reduce deformation of the substrate (innate characteristic of the edges of the suction plate), the combination of Koumura et al. and Kitahara et al. *does not* specifically teach reducing the deformation of the substrate between the rollers. *However*, Yasui et al. teach an ink-jet printing system with a transport mechanism that includes a plurality of rollers, a negative gauge pressure source, and an element which is arranged to reduce deformation of the substrate between the

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rollers (Yasui et al. - Title; Abstract; Summary, Column 3, Lines 2-42 and Figure 2, Reference #14, #24, #31, #29, and Arrows, shown above).

c. As related to dependent **claim 21**, while the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 7** for the reasons above the combination of Koumura et al. and Kitahara et al. **does not** specifically teach the element arranged to be spaced apart from the substrate. **However**, Yasui et al. teach an ink-jet printing system with a transport mechanism that includes a plurality of rollers, a negative gauge pressure source, and an element which is arranged to be spaced apart from the substrate (Yasui et al. - Title; Abstract; Summary, Column 3, Lines 2-42 and Figure 2, Reference #3, #14, #24, #31, #29, and Arrows, shown above).

d. As related to dependent **claim 22**, while the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 7** for the reasons above the combination of Koumura et al. and Kitahara et al. **does not** specifically teach the element is substantially non-porous. **However**, Yasui et al. teach an ink-jet printing system with a transport mechanism that includes a plurality of rollers, a negative gauge pressure source, and an element which is substantially non-porous [i.e. solid or completely non-porous] (Yasui et al. - Title; Abstract; Summary, Column 3, Lines 2-42 and Figure 2, Reference #14, #24, #31, #29, and Arrows, shown above).

Given the same field of endeavor, specifically an ink-jet printing system with a substrate transport mechanism, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording apparatus with a negative gauge pressure source and a plurality of rollers as taught by the combination of Koumura et al. and Kitahara et al. with the ink jet recording apparatus

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with a negative gauge pressure source and a plurality of rollers with the additional arrangement of the element as taught by Yasui et al., in an effort to provide an ink jet printing system which is effective in maintaining the substrate in a flat condition with respect to the print head (Yasui et al. – Summary, Column 3, Lines 33-36).

7. **Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Koumura et al.** (US 4,463,361 A) and **Kitahara et al.** (US 2002/0018097 A1) as applied above and further in view of **Martin et al.** (US 5,255,020 A).

While the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above, and the practice of printing at extremely high speeds is well known and documented in the art, the combination of Koumura et al. and Kitahara et al. teaches *does not* specifically teach moving the substrate at a speed greater than 1m/s. *However*, Martin et al. teach a printing assembly which uses negative gauge pressure to maintain the substrate a set distance from the printing nozzles while moving the substrate at a speed greater than 1m/s [i.e. a plurality of meters per second] (Martin et al. – Title; Abstract; Specification, Column 1, Lines 25-30). Given the same field of endeavor, specifically an ink-jet printing system with a substrate transport mechanism, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording apparatus with a negative gauge pressure source and the desire to follow the practice in the art at the time of the invention, that being to increase throughput and print resolution as taught by the combination of Koumura et al. and Kitahara et al with the ink jet recording apparatus with a negative gauge pressure source as taught by Martin et al., in an effort to control accurately the distance between the nozzles and the surface of the media and the emission of the ink

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drops as a function of the advance of the paper (Martin et al. – Specification, Column 1, Lines 33-40).

8. **Claim 24** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Koumura et al.** (US 4,463,361 A) and **Kitahara et al.** (US 2002/0018097 A1) as applied above and further in view of **Greive** (US 6,834,949 B2).

While the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach no roller is contacting the surface of the substrate in the immediate area of printing (Koumura et al. – Figure 1, Reference #22, #23, #7B, #8B, #9B, shown previously), the combination of Koumura et al. and Kitahara et al. *does not* specifically teach no roller is arranged so as to contact the surface of the substrate to be printed. *However*, Greive clearly teaches a device for holding a substrate, moving a substrate, and printing the substrate with a plurality of rollers and a negative gauge pressure applicator, with an arrangement such that no roller is arranged so as to contact the surface of the substrate to be printed (Greive - Title; Abstract; Description, Column 6, Lines 5-31; and Figure 1, Reference #1, #2, and Airflow Arrows, shown below). Given the same field of endeavor, specifically an ink-jet printing system with a negative pressure substrate transport mechanism, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording apparatus with a negative gauge pressure source as taught by the combination of Koumura et al. and Kitahara et al. with the ink jet recording apparatus with a negative gauge pressure source as taught by Greive, in an effort to control

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accurately the distance between the nozzles and the surface of the media (Grieve – Summary, Column 3, Lines 28-31) and prevent premature contact with newly recorded image, allowing further drying time and providing a higher quality image.

9. **Claim 25** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Koumura et al.** (US 4,463,361 A) and **Kitahara et al.** (US 2002/0018097 A1) as applied above and further in view of **Baldwin-Garcia** (US 2003/0016983 A1).

While the combination of Koumura et al. and Kitahara et al. teaches the limitations of **claim 1** for the reasons above and continues to teach the printheads are arranged directly adjacent to a roller for emitting ink onto a region of the substrate (Kitahara et al. – Figure 23A, Reference #81* & 80*, shown above), the combination of Koumura et al. and Kitahara et al. *does not* specifically teach the substrate is in contact with the roller. *However*, Baldwin-Garcia teaches a printing apparatus with a plurality of rollers arranged to move a substrate past printheads during emission of ink droplets from the printheads to print an image, wherein the printheads are arranged directly adjacent to a roller for emitting ink onto a region of the substrate in contact with the roller (Baldwin-Garcia – Title; Abstract; Detailed Description, Page 3, Paragraphs 26-27; and Figure 4, Reference #104' & #120, shown below). Given the same field of endeavor, specifically an ink-jet printing system with a substrate transport mechanism comprised of a plurality of rollers, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the ink jet recording apparatus with a negative gauge pressure source and the plurality of rollers not specifically deposited such that the

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substrate is in contact with them as taught by the combination of Koumura et al. and Kitahara et al. with the printing system with a substrate transport mechanism comprised of a plurality of rollers as taught by Baldwin-Garcia, in an effort to depict that which was well known in the art of substrate conveyance and transport at the time of the invention and provide a variety of media transport or advancing means without departing from the scope of the field of endeavor (Baldwin-Garcia – Summary and Detailed Description, Page 3, Paragraphs 26-27).

Response to Arguments

10. Applicant's arguments with respect to **claims 1 & 17** have been considered but are moot in view of the new ground(s) of rejection.

11. With respect to **claims 1 & 17**, and therefore **claims 2-4, 6-15, & 21-24**, which inherently contain all of the limitations of independent **claim 1**, applicant amended the independent claim to add significant limiting language, further clarification and more clearly point out the claimed subject matter. Due to these amendments, a further search was necessitated thereby producing additional prior art of record and a more specific notation of existing prior art of record. Applicant argues that "None of the references cited by the Examiner teach or suggest ... claim 1." Applicant continues to argue that "there is no teaching or suggestion in Koumura of a method in which an image is printed in a single pass of the printheads across the substrate." Applicant continues to argue that "Yasui et al. best relates to a printer... (with) no teaching or suggestion of a printer as defined in claim 1, nor of a method as defined in claim 17 of the present application..." While Yasui et al. does teach a "multi-nozzle

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printhead [i.e. a page-width or line printhead], the additional prior art of record clearly teaches the added limitations as indicated above. Applicant traversed the rejection of the dependent claim solely based on their dependence to the independent claim. Applicant is requested to review the rejection as put forth above. As no further arguments were made, all dependent claims and newly added claims have been rejected accordingly.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rasmussen et al. (US 2002/0057321 A1) teaches a transport device for use in a printing apparatus which includes a plurality of rollers directly adjacent to the printhead, the rollers either contact the substrate directly or contact a belt which contacts the substrate. Wotton et al. (US 2005/0035990 A1) teaches line or page-width printheads adjacent a roller for emitting ink onto a region of substrate which is in contact with the roller.

13. ***Examiner's Note:*** Examiner has cited particular Figures & Reference Numbers, Columns, Paragraphs and Line Numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Zimmermann whose telephone number is (571)270-3049. The examiner can normally be reached on Monday - Thursday, 7:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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